

Assessment of Data Assimilation with the Protoype High Resolution Rapid Refresh for Alaska (HRRRAK)

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The Arctic Region Supercomputing Center has been running a quasi-operational prototype of a High Resolution Rapid Refresh for Alaska (HRRRAK) at 3km resolution, initialized by the 13km Rapid Refresh (RR). Although the RR assimilates a broad range of observations into its analyses, experiments with the HRRRAK suggest that there may be added value in assimilating observations into the 3km initial conditions, downscaled from the 13km RR analyses.

The NASA Short-term Prediction Research and Transition (SPoRT) group has been using assimilated data from the Atmospheric Infrared Sounder (AIRS) in WRF and WRF-Var simulations since 2004 with promising results. The sounder is aboard NASA's Aqua satellite, and provides vertical profiles of temperature and humidity. The Gridpoint Statistical Interpolation (GSI) system is then used to assimilate these vertical profiles into WRF forecasts. In this work, we assess the use of AIRS data in combination with other global data assimilation products on non-assimilated HRRRAK case studies. Two separate weather events will be assessed to qualitatively and quantitatively assess the impacts of AIRS data on HRRRAK forecasts.

Abstract submitted to the 2012 Alaska Weather Symposium (March 13-14, 2012) at the University of Alaska Fairbanks in Fairbanks, Alaska